

PUBLIC HEALTH REPORTS

VOL. 48

SEPTEMBER 8, 1933

NO. 36

COMPARABILITY OF SICKNESS RECORDS OF PUBLIC UTILITIES

By DEAN K. BRUNDAGE, Statistician, *Office of Industrial Hygiene and Sanitation, United States Public Health Service*

Analysis of the sickness records of certain public utilities has brought out some interesting facts in regard to the comparability of these records and the necessity for considering the effect upon illness rates of such factors as sex and occupation when developing work aimed at the prevention of sickness among industrial employees.

The problem of comparability of records was approached by ascertaining the frequency rates of illnesses of different duration for each one of the public utilities reporting to the United States Public Health Service in 1930 and 1931. The data for companies having similar sickness curves were included in the same graph.

THREE TYPES OF SICKNESS CURVES ACCORDING TO DURATION

This scheme disclosed three different types of curves of sickness frequency according to duration. The first one (fig. 1) starts at a high level of sickness frequency, but descends abruptly. The second curve (fig. 2) begins at a lower incidence level and descends more gradually. The third type (fig. 3) is flatter than either of the others and exhibits curious humps at the beginning of the curve. A composite curve for each of these types is shown in figure 4 to facilitate comparison.

It is obvious from the differences in the shapes and magnitudes of the sickness curves of several reporting units of the industry that direct comparison of the sickness rates of certain companies is unwarranted without consideration of the factors reflected in these dissimilar curves.

NATURE OF THE SICKNESS INSURANCE PLAN

In figure 1, which exhibits the highest sickness rates, the companies (utilities A and B) grant liberal sick leave to their employees. In each the sick-benefit plan is financed entirely by the company. In utility A the men paid on a per hour basis (group A2 in fig. 1) receive no pay for the first and second day of absence from work on

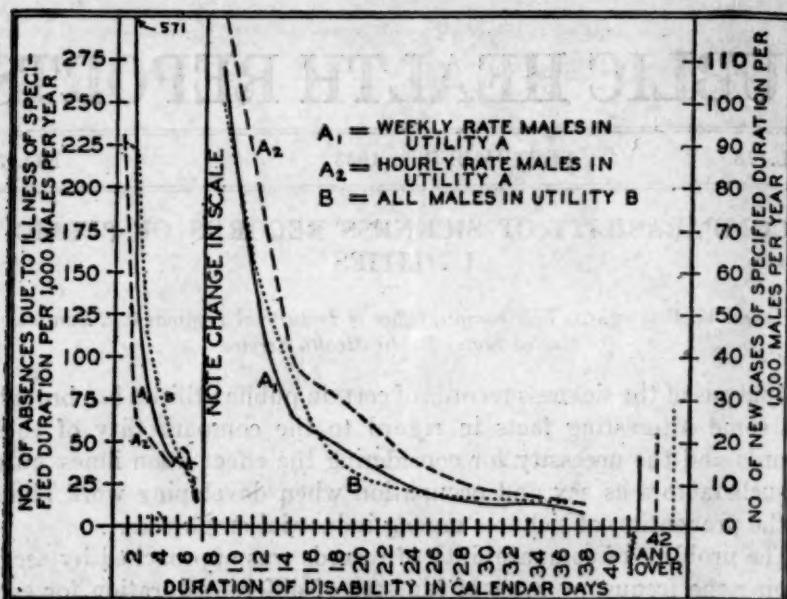


FIGURE 1.—Incidence rates of illness (including nonindustrial accidents) of specified duration in calendar days of disability. Experience in 1930 and 1931 of male employees of two public utilities paying sickness benefits which approximate full wages. (Rates for cases lasting less than 1 week are computed for each single day of duration. Rates for cases of more than 1 week are computed on a weekly basis.)

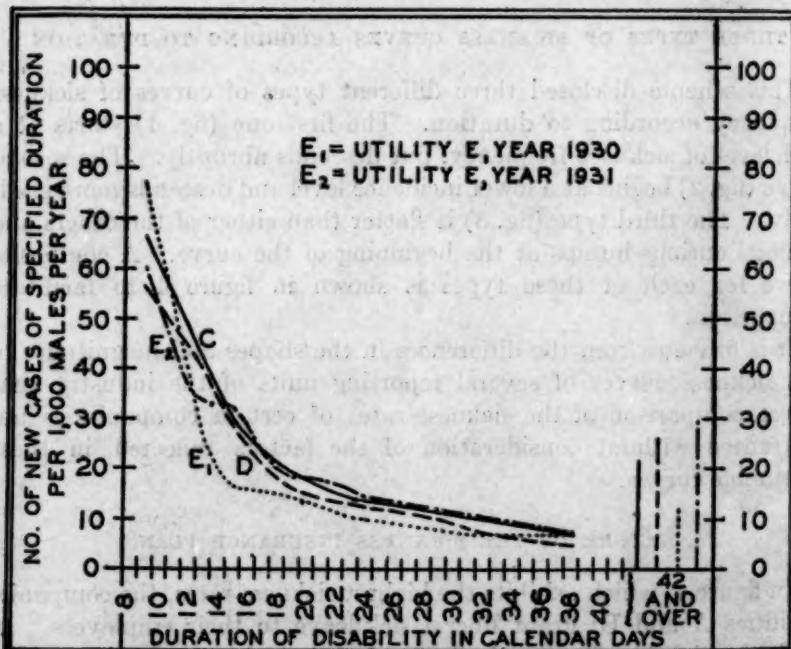


FIGURE 2.—Incidence rates of illness (including nonindustrial accidents) of specified duration in calendar days of disability. Experience in 1930 and 1931 of male employees of each of three public utilities which contribute to their employees' sick-benefit associations. (Rates are computed on weekly basis.)

account of disability, but in other respects fare the same as the men paid by the week (group A1 in fig. 1). The general provisions as regards sickness in utility A are as follows: (a) Persons with the company from 6 months to 2 years receive *half pay* from the first day of disability to a maximum limit of 9 weeks of either continuous or aggregate sickness within any 1 year; (b) persons with the company from 2 to 3 years receive *three quarters* pay from the first day of disability to a limit of 18 weeks; and (c) persons with the company more than 3 years receive *full pay* limited to 6 months of sickness. Persons on the monthly pay roll are not included in the statistics for utility A.

In utility B, employees of less than 1 year's service have an illness allowance at full pay of 1 day per month of employment. Individuals having more than 1 year's service receive full pay up to a limit of 15 weeks, and a certain proportion of wages thereafter, depending on the employee's length of service with the company.

These liberal provisions enable employees to stay home and undergo appropriate treatment for their ailments, especially colds and other so-called minor illnesses. Since the companies report very little evidence of malingering, it is quite possible that the record for utilities A and B approximates the normal sickness curve.

In each of the public utilities included in figure 2 the sick-benefit plan is financed jointly by the company and its employees. Among these companies utility D offers the highest schedule of benefits, but it does not so nearly approach full wages as in utilities A and B, especially as regards those on the hourly rate pay roll of utility D who receive only three fourths of the percentage of pay provided for disabled employees on the monthly rate pay roll. In this group of companies no sick benefits are paid for the first week of disability except in utility D which pays full wages to disabled workers on its monthly rate pay roll and one-half pay to disabled hourly rate employees who have had more than 2 years' service with the company.

For utility E two curves are shown—one for the year 1930 and the other for the year 1931 because the schedule of benefits was made more liberal on January 1, 1931. Benefits were increased from 50 percent to an average of approximately 66 percent of wages after the first week of disability.

In utility C the cash benefits were only \$1 per day payable after the first 5 days of any continuous sickness up to a maximum of 200 days' disability. However, medical service is provided for employees and their dependents, which obviously increases the value of the benefits.

For cases causing disability from 8 to 20 days the sickness rates shown in figure 2 tend to fall below those exhibited in figure 1. The most significant point about the sick-benefit plans of the two groups

of utilities seems to be that one group pays virtually full wages during disability for a certain number of weeks, while in the other group different proportions of total wages are paid during illness. It seems reasonable to presume that the sickness rates in the groups shown in figure 2 were more affected by economic considerations than in those in the group receiving full wages during disability. When a certain percentage of wages is sacrificed, most patients probably attempt to return to work at the earliest possible moment

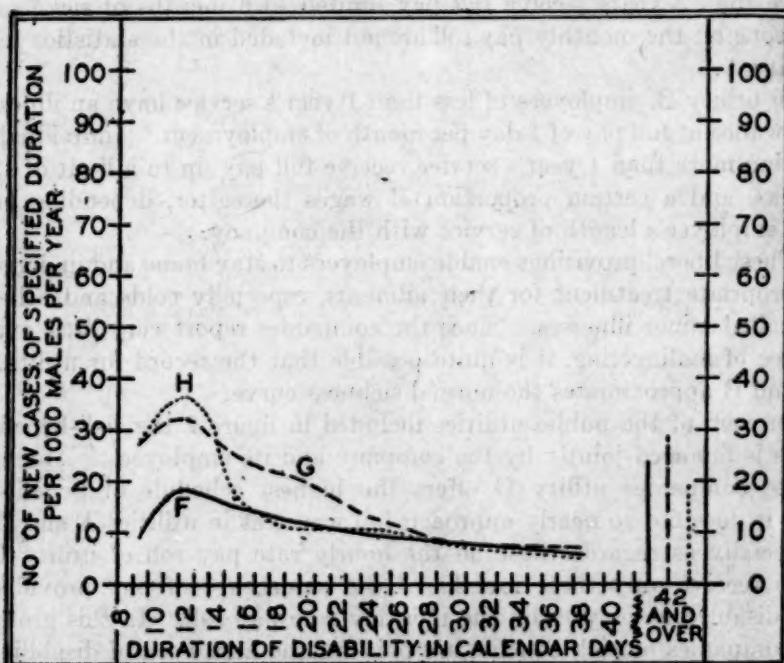


FIGURE 3.—Incidence rates of illness (including nonindustrial accidents) of specified duration in calendar days of disability. Experience in 1930 and 1931 of male employees of two public utilities which entirely finance sickness benefits for illnesses of more than 1 week's duration (companies F and G), and of one utility which contributes to its employees' sick-benefit association (company H). (Rates are computed on weekly basis.)

Whether such a tendency involves any appreciable risk of health could be ascertained only by a special study.

In the third group (fig. 3), two companies (F and G) pay the entire cost of the sick-benefit plan. Utility F pays benefits of \$1 per day for each day's disablement after the seventh day, but the amount payable in any 1 year to any one employee is limited to \$90. In utility G, wage earners receive half pay and salaried employees full pay up to a 6 months' maximum for any one case of illness. Differing from these company-financed plans, utility H follows a cooperative scheme of sickness insurance to which the company and those employees who belong to the mutual benefit association pay monthly.

dues. The amount of cash benefits depends upon the member's length of service with the company, ranging from 65 to 75 percent of his regular wage or salary.

Despite these differences in the sickness insurance plans of the three companies, their sickness curves are much alike. In each the shape of the curve deviates from that of the normal or usual sickness curve. Ordinarily one finds that the total number of cases of sickness from all causes combined diminishes with each day's increase in duration. Thus one may expect fewer 9-day cases of sickness than 8-day illnesses, fewer 10-day than 9-day disabilities, and so on.

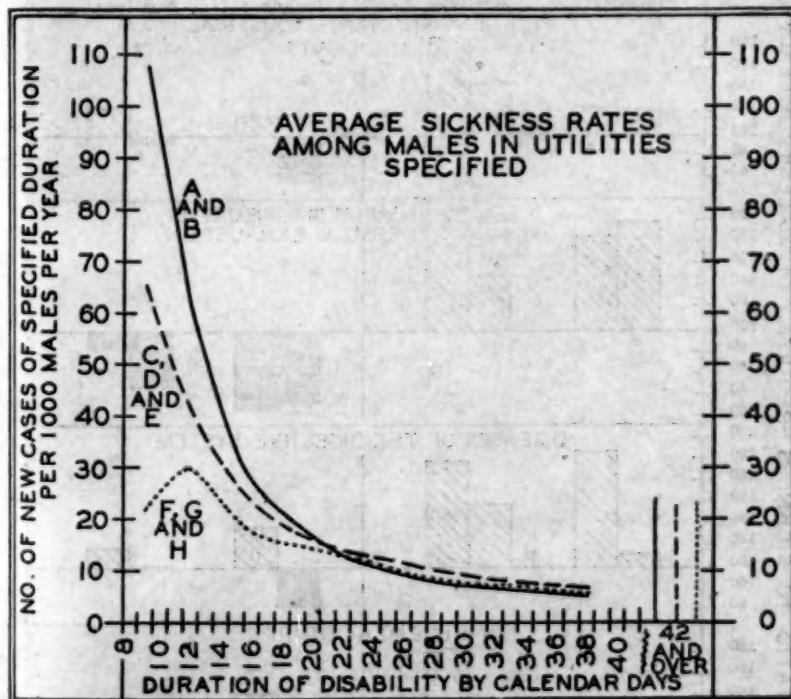


FIGURE 4.—Average incidence rates of illness (including nonindustrial accidents) for each of the groups of companies shown in the three preceding charts. (Rates are computed on weekly basis.)

This tendency is apparent in the records of absence from school on account of illness, as well as in the sickness records of industrial establishments.¹ In the three utilities under consideration there was a marked deficiency of cases lasting 8 to 12 days. That this may have been due to chance appears to be ruled out by the fairly large number of cases in each duration category (smallest number in any category, 37; largest number, 583; median, 91). Therefore, a question which may be worth investigating in these three companies is

¹ Cf. Health of the School Child. Pub. Health Bull. No. 200. Government Printing Office, Washington, 1931, p. 131; also Disabling Sickness among Employees of a Rubber Manufacturing Establishment in 1918, 1919, and 1920. Pub. Health Rep., Dec. 15, 1922. Reprint No. 804, p. 9.

whether all cases causing disability from 8 to 12 or more days actually get into the record either through neglect of employees to claim sick benefits for the shorter cases or for some other reason.

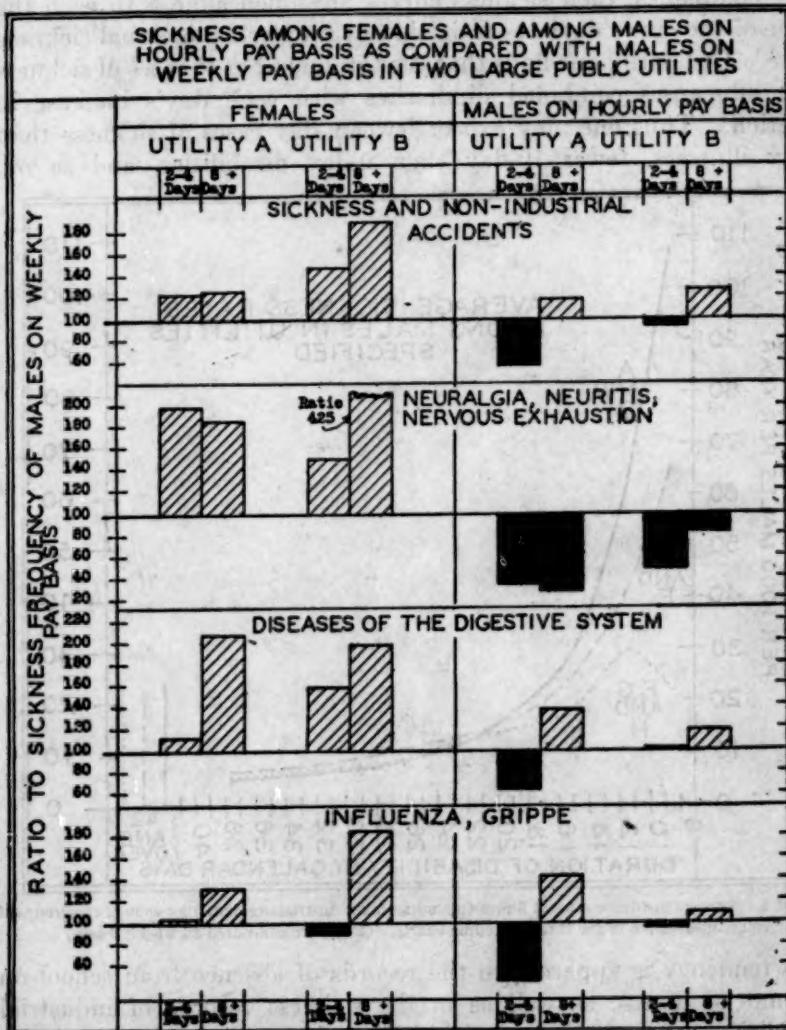


FIGURE 5.—Excess or deficiency of sickness frequency among females and among males on a per hour pay basis as compared with males on a weekly pay basis in two large public utilities during 1930 and 1931. Male sickness rates were adjusted to the age distribution of the females.

SICKNESS AMONG WOMEN AND AMONG MEN ON AN HOURLY PAY BASIS AS COMPARED WITH MEN ON A WEEKLY PAY BASIS

From the foregoing discussion it appears that utilities A and B may be placed in the same category on account of similarity of sick-leave provisions, and that their illness rates may be compared. The sickness experience of 3 groups of workers in each of these 2 com-

panies appears worth presenting in broad outline on account of certain interesting differences in their morbidity.

In utility A the incidence rate of cases causing disability for more than 1 week was higher among women and also among men on an hourly pay basis than among men on a weekly pay basis. A very small number of men are paid by the hour in utility B; but for ascertaining whether the same tendency was in evidence there for similar occupational groups, occupations were selected in utility B to correspond with those in utility A. For convenience these occupational groups are designated as "hourly rate" and as "weekly rate" males in both companies.

The "hourly rate" group includes linemen, installers, repairmen, helpers, firemen, meter testers, station operators, truck drivers, chauffeurs, oilmen, oilers, watertenders, mechanics, cleaners, porters, and laborers. They may be broadly characterized as manual workers.

The "weekly rate" males include clerks, draftsmen, salesmen, collectors, foremen, inspectors, testmen, troublemen, meter readers, and certain other occupations which for present purposes may be designated as nonmanual. Using this group as a basis for comparison, one finds that the sickness incidence rates were considerably higher among the women, and the occurrence of cases of 8 days and longer was higher also among the males doing manual work. These results cannot be attributed to differences in age, because the sickness rates of each of the two groups of males were adjusted to the age distribution of the females.

The frequency of short cases, i.e., those causing absence from work for 2, 3, or 4 days, as well as the longer cases (disabilities lasting more than 1 week) was higher among the women than among the non-manual males, even though diseases not common to both sexes were omitted from consideration. The female rates were very high for neuralgia, neuritis, and nervous exhaustion; but the numbers on which these rates were based were not large enough for satisfactory interpretation. However, equally wide differences were found in the frequency of neurasthenia according to sex in other, more adequate data.² The female rates were relatively high, also, for diseases of the digestive system in each of the two companies. For influenza or grippe the female rate of cases lasting longer than 1 week considerably exceeded the corresponding rates for the group of males under consideration.

The higher rate of 8-day and longer disabilities among manual than among nonmanual male employees is partly explained by the more frequent occurrence of diseases of the digestive system and influenza

² Cf. Sickness Among Industrial Employees. Pub. Health Rep., Feb. 22, 1929. Reprint No. 1265, table 6, p. 11.

among the former. On the other hand, for the manual group the rate was surprisingly low for neuralgia, neuritis, and nervous exhaustion in each of the two utilities.

TABLE 1.—*Sickness among females and among males on an hourly pay basis as compared with males on a weekly pay basis in two large public utilities during 1930 and 1931*¹

Disease group	Utility A				Utility B			
	2- to 4-day disabilities		8-day or longer disabilities		2- to 4-day disabilities		8-day or longer disabilities	
	Annual number of disabilities per 1,000 persons	Ratio to sickness among males on weekly pay basis	Annual number of disabilities per 1,000 persons	Ratio to sickness among males on weekly pay basis	Annual number of disabilities per 1,000 persons	Ratio to sickness among males on weekly pay basis	Annual number of disabilities per 1,000 persons	Ratio to sickness among males on weekly pay basis
Sickness and nonindustrial accidents:								
Males on weekly pay basis.....	282.5	100	110.8	100	448.9	100	105.1	100
Males on hourly pay basis.....	164.1	58	131.2	118	419.0	94	134.9	128
Females.....	347.5	123	139.7	126	665.3	148	199.0	189
Neuralgia, neuritis, nervous exhaustion:								
Males on weekly pay basis.....	3.5	100	4.3	100	7.9	100	2.8	100
Males on hourly pay basis.....	1.2	34	1.2	28	3.8	48	2.3	82
Females.....	7.0	200	8.0	186	11.9	151	11.9	425
Diseases of the digestive system: ²								
Males on weekly pay basis.....	38.9	100	14.0	100	90.8	100	13.9	100
Males on hourly pay basis.....	24.7	64	19.2	137	93.2	108	16.5	119
Females.....	44.2	114	29.2	209	142.8	157	27.5	198
Influenza, grippe:								
Males on weekly pay basis.....	100.3	100	31.4	100	68.4	100	23.0	100
Males on hourly pay basis.....	46.2	46	44.4	141	65.0	95	24.9	108
Females.....	102.6	102	41.6	133	60.5	89	42.3	184

Number of years of life under observation, utility A: Males on weekly pay basis, 3,815; males on hourly pay basis, 4,573; females, 1,131. Utility B: Males on weekly pay basis,³ 2,169; males on hourly pay basis,³ 2,683; females, 1,422.

¹ Exclusive of diseases not common to both sexes. The sickness rates of the males have been adjusted to the age distribution of the females.

² Exclusive of diseases of the pharynx and tonsils; otherwise the same as in the International List of the Causes of Death, 4th revision, Paris, 1929.

³ Only a few occupations in utility B are on a per hour pay basis; hence for comparative purposes the occupations in utility B which corresponded to those on an hourly pay basis in utility A were taken.

These differences appear wide enough to indicate that sickness-preventive work, if it is to be effective in public utilities, must be based on the facts obtained by analysis of sickness experience according to sex and occupation. It should be worth knowing, for example, what occupations in these utilities showed the greatest excess in illness of a digestive nature, or the highest rates of influenza, or the kinds of work that were associated with a minimum frequency of nervous exhaustion. Knowledge of the causes of the higher rate of cases lasting longer than 1 week in the manual than in the nonmanual group should prove helpful in solving whatever problems may be reflected in such differences in the incidence of illness.

SUMMARY

Wide differences in the indicated frequency of disabling sickness among employees of several public utilities were studied in relation to the plan of sickness insurance in force. The sickness rates of employees of companies granting sick leave for a certain period at full pay were found to be not comparable with the illness rates recorded for groups of employees receiving only a certain percentage of full pay during disability. When the incidence rates for illnesses of different duration were computed for each utility for which sickness records were available, three different types of illness curves resulted. The type of sickness curve and principal features of the sick-benefit plan appear as important considerations when determining the comparability of the sickness rates of one company with those of another.

In two public utilities in which the sickness data appeared to be comparable, the illness rates of male nonmanual workers were compared with those of females and of males in manual occupations. These three groups of employees showed such differences both in the frequency of total sickness and in the rates for certain groups of diseases as to indicate the desirability of periodic analysis of sickness frequency in different occupations as a basis for more effective administration of the medical and health services maintained for employees of the industry.

THE EFFECT OF CALCIUM ON TRANSPLANTED MOUSE TUMORS

By M. J. SHEAR, *Biochemist, Field Investigations of Cancer, United States Public Health Service*

In 1905 Beebe reported that the calcium content of rapidly growing human tumors was smaller than that of slowly growing tumors. Subsequent investigators have confirmed Beebe's analytical observations and, in addition, have reported that calcium therapy results in a retardation of tumor growth. It has also been reported that in cancer the total serum calcium (Theis and Benedict; Leicher; Svehla; Harnes; de Fermo) and the calcium ion concentration of the blood serum (Waterman; Rémond, Sendrail and Lassalle; Reding; Reding and Slosse; Beregoff) are diminished. Furthermore, administration of parathyroid hormone, which is an important factor in calcium metabolism, has been reported as giving favorable results in the treatment of cancer (Goldzieher and Rosenthal) and has even been advocated as a prophylactic (Reding and Slosse). Beneficial results have also been attributed (Barelli; Harde) to the use of vitamin D, which is a regulator of calcium metabolism.

During the quarter of a century that has elapsed since the initial observations of Beebe were published, a rather large literature has grown up on the subject of the role of calcium in cancer. Since this literature has already been reviewed in detail elsewhere (Shear), it will be sufficient here merely to cite the names of those who have reported obtaining a retarding effect on tumor growth in experimental animals or in patients by means of treatment with calcium: Goldzieher; Goldzieher and Rosenthal; Katase, Kawamura and Mizutani; Hoshino; Sugiura and Benedict; Händel; Goldfeder; McDonald; Paik; and Jinguu. In some instances the calcium was given orally, in others parenterally. Retarding effects of calcium on the growth of tumors *in vitro* or on the growth of tumors transplanted after immersion in solutions of calcium salts were noted by the following named investigators: Cramer; Sugiura, Noyes and Falk; Roussy and Wolf; Troisier and Wolf; Wolf; Roffo; and Roffo and Encina.

Not all of the investigators who treated malignant growths with calcium obtained favorable results. A smaller number of authors reported negative findings, following administration of calcium. However, their work was not conclusive. Thus, Rohdenburg and Krehbiel made the statement that calcium failed to cause any diminution or recession in growth of mouse sarcoma 180, but gave no details. Kimura and Wada treated pieces of transplantable tumors with calcium solutions and noted no retardation of the rate of growth of the tumors as a result of the treatment; the number of animals used was not stated. Renaud injected cancer patients with calcium gluconate, but all the cases went to a fatal termination; the calcium salt did not cause recession or prevent metastases. No mention was made of the number of patients so treated. Koerbler treated rats bearing a transplanted sarcoma with a calcium preparation without effect; details, however, were not given. Slosse and Reding obtained poor results on injecting CaCl_2 intravenously into 10 cancer patients; but later Reding and Slosse maintained that efforts should be made to raise the serum calcium ion concentration in cancer by means of parathormone.

The few reports of negative results following treatment with calcium were not sufficiently convincing to warrant the conclusion that calcium is without effect on tumor growth. On the other hand, the reports of positive results, while more numerous, were not sufficiently conclusive either. It was therefore considered desirable to investigate the effect of calcium treatment on transplanted mouse tumors. Since the results obtained were essentially negative, the various experiments will be described but briefly.

PARENTERAL ADMINISTRATION

(In collaboration with Biologist H. B. Andervont)

In these experiments the solutions used were 5 percent calcium lactate, 5 percent calcium gluconate, and 10 percent sodium lactate.

EXPERIMENT I

Calcium lactate.—Two weeks prior to inoculation with sarcoma 180, a 5 percent solution of calcium lactate was injected intravenously into 12 mice in 0.15 cc doses. The solution was injected intravenously eight times, after which the injections could no longer be made in the same way because of the condition of the tail and it was then given twice by the subcutaneous route.

After inoculation, the mice were given 9 intraperitoneal injections of 0.3 cc each. Tumors appeared in only 3 mice, and in 2 of these the tumors receded. In the controls, tumors appeared in 18 out of 20 mice.

However, the mice were in poor condition as a result of the treatment with calcium lactate.

Calcium gluconate.—Another group of 12 mice was given 0.2 cc doses of a 5 percent calcium gluconate solution in an analogous fashion, beginning 2 weeks prior to tumor inoculation; 8 injections were given by the intravenous route and 2 by the subcutaneous. Only 7 mice survived the 2 weeks' treatment, after which the survivors were inoculated with sarcoma 180. The mice were then given several subcutaneous injections of 0.3 cc and several more of 0.5 cc, totaling 9 additional injections.

For about 2 weeks the tumors in the treated mice were smaller than the control tumors; the percentage of takes was also less in the former than in the latter. But 2 weeks later the results, both as to the percentage of takes and as to the size of the tumors, were the same in both groups.

Sodium lactate.—The effect of sodium lactate was also studied. Ten mice were given 13 intravenous doses of 0.3 cc each, and 10 were given 13 subcutaneous doses of 0.5 cc each, of a 10 percent sodium lactate solution. Then the mice were inoculated with sarcoma 180. The administration of sodium lactate was continued following inoculation, in 0.5 cc subcutaneous doses.

No effect on tumor growth or on the percentage of takes was noted.

EXPERIMENT II

Calcium lactate.—This solution was given intraperitoneally to 10 mice in 9 doses of 0.3 cc each, beginning the day before inoculation with sarcoma 180. All the mice survived, but no effect on the tumors was noted when compared with the controls.

Calcium gluconate.—This solution was given subcutaneously to 10 mice in 8 doses of 0.5 cc each, beginning the day before inoculation with sarcoma 180. Nine mice survived, but no effect on the tumors was noted when compared with the controls.

EXPERIMENT III

Eleven mice were given calcium lactate and 11 were given calcium gluconate intraperitoneally. The mice did not tolerate 0.5 cc doses, and some of them died; the dose was reduced to 0.2 and 0.3 cc levels. Treatment was begun 2 weeks prior to inoculation with sarcoma 180 and was continued until 16 injections had been given.

The tumors in the treated mice were no different from those in the 22 control mice.

EXPERIMENT IV

Twelve mice were given calcium gluconate intraperitoneally and 12 subcutaneously; 22 other mice were given calcium lactate intraperitoneally. Treatment was begun 10 days before inoculation with sarcoma 180 and was continued subsequently to a total of 17 injections of 0.2 or 0.3 cc each.

This treatment produced no detectable effect on the tumors when comparison was made with the controls.

EXPERIMENT V

Twenty-four mice were given 7 intravenous injections of 0.15 cc each, 12 receiving calcium gluconate and 12 calcium lactate. They were then inoculated with sarcoma 180, and were given 6 intraperitoneal injections of 0.3 cc each, of the respective solutions.

The tumors took in all cases. When the experiment was terminated, the tumors were as large, in most cases, as in the controls; however the tumors receded in 3 given calcium gluconate and in 1 given the calcium lactate.

DIET EXPERIMENTS

I. 3.3 PERCENT CALCIUM CHLORIDE

CaCl_2 was mixed in the ration so as to give a calcium content of 1.2 percent. This was fed to 20 mice for 3 weeks, at the end of which time these mice together with 20 controls, were inoculated with carcinoma 63. The high calcium diet was continued after inoculation. Three weeks after inoculation there were more tumors among the control mice than among the treated mice, but one week later the percentage of successful takes was the same in both groups.

In this experiment, therefore, the calcium chloride seemed to delay the appearance of the tumors somewhat, but the number of takes and the size of the tumors were approximately the same in both groups five weeks after inoculation.

II. 2.75 PERCENT CALCIUM CHLORIDE

Twenty mice were fed a diet consisting of 3 parts whole wheat flour and 1 part whole milk powder; this ration also contained 1 percent calcium in the form of CaCl_2 . The test diet was given for 2 months, at the end of which time these mice, together with 20 control mice, were inoculated with sarcoma 180. In both groups there were 100 percent takes. The tumors in the treated mice were somewhat smaller, on the average, than those in the controls, but no marked difference was noted.

III. MODIFIED STEENBOCK DIET

A diet was prepared similar to ration 2965 of Steenbock and Black, except that the 1.2 percent calcium was provided by CaCl_2 instead of CaCO_3 . Another similar diet was prepared containing 2.0 percent CaCl_2 instead of 3.3 percent.

These diets are rich in calcium and poor in phosphorus, and consequently promote the absorption of large amounts of calcium. The chloride, which is an acid-forming salt in the body, was used instead of the carbonate, since it is alleged that in cancer there is a tendency to alkalosis.

These 2 diets were given to 2 groups of 30 mice each for 9 days prior to inoculation with sarcoma 180; the same dietary regime was continued until the experiment was terminated. The control group also consisted of 30 mice.

No pronounced difference was noted in the tumors. Although among the treated mice there were more small tumors than in the controls, the results were not striking.

IV. $\text{CaCl}_2 + \text{NH}_4\text{Cl}$

A. In order to increase the acid-forming properties of the diet, NH_4Cl was added in addition to CaCl_2 . The basal ration (3 parts whole wheat flour to 1 part whole milk powder) was fed to 20 control mice, while the test ration, consisting of the basal ration plus 3.3 percent CaCl_2 and 1.5 percent NH_4Cl , was fed to another group of 20 mice beginning with the day of inoculation with sarcoma 180. After 15 days the NH_4Cl content was increased to 2.0 percent.

After 4 weeks the tumors in the treated mice were just as large, in some cases, as those in the controls; in many others, however, the tumors were definitely smaller.

B. Carcinoma 63 was inoculated into 40 young mice. A week later half of the mice were given the diet containing 3.3 percent CaCl_2 and 2.0 percent NH_4Cl .

The mice appeared in good condition, but did not grow. However, no retarding effect on tumor growth was noted.

C. Since, in some experiments, there were indications of a retarding effect, the experiment was repeated, using 200 mice. The mice were divided into 5 groups of 40 mice each, as follows:

- Group A: Basal diet + 3.3% CaCl_2 + 1.5% NH_4Cl .
- Group B: Basal diet + 3.3% CaCl_2 + 2.0% NH_4Cl .
- Group C: Basal diet + 3.3% CaCl_2 + 2.5% NH_4Cl .
- Group D: Basal diet + 3.3% CaCl_2 + 3.0% NH_4Cl .
- Group E: Basal diet alone (controls).

After administration of these diets for 1 week, all the mice were inoculated with sarcoma 180. The diets were continued until the end of the experiment. The mice tolerated these high-salt diets fairly well.

No clear-cut differences were noted between the tumors in the treated and control mice 3 weeks after inoculation. However, the tumors in the mice of groups A and B did not grow quite as well as those in the other groups.

V. PROTEIN + CaCl_2

Because of interesting results which were being obtained with proteins in some other experiments, mice were given a high protein diet in addition to CaCl_2 .

A. Sarcoma 180 was inoculated into 16 mice. After 11 days a high protein diet consisting of 1 part dried egg albumin and 2 parts whole-milk powder was given to 6 of these mice; 10 days later 3.3 percent CaCl_2 was included in the experimental ration.

No beneficial results were noted.

B. Sarcoma 180 was inoculated into 30 mice. Three days later the high protein diet was given to half of the mice; 10 days later 3.3 percent CaCl_2 was also included in the diet.

In 3 of the treated mice, the tumors were "eaten out", and in 1 other the tumor had receded.

C. Carcinoma 63 was inoculated into 30 mice. Two weeks later half of the mice were given the high-protein diet, and 1 week later 2 percent CaCl_2 was also given.

The tumors in the treated mice were somewhat smaller than the control tumors, but the difference was not striking.

D. The high-protein diet plus 1 percent CaCl_2 was given to 16 young mice on the day of inoculation with carcinoma 63. The CaCl_2 content was increased to 2 percent 4 days later. The growth of the mice was stopped; they remained small and thin, and many of them died. No effect on tumor growth was obtained.

VI. PROTEIN + CaCl_2 + NH_4Cl

A. Whole-milk powder containing 3 percent of a salt mixture consisting of 2 parts CaCl_2 to 1 part NH_4Cl was given to 13 mice. Four

days later they were inoculated, together with 14 controls, with sarcoma 180.

The tumors in the treated mice were smaller than those in the controls, but the treated mice did not do well; most of them died within 1 month after inoculation, at which time most of the controls were still alive.

B. Thirty mice were inoculated with carcinoma 63. Two weeks later half of the mice were given the high protein diet. One week later 3.3 percent CaCl_2 and 2.0 percent NH_4Cl were included in the experimental ration.

Administration of this diet for 4 weeks failed to produce any noticeable effect on tumor growth.

C. Fifteen mice were given a diet consisting of equal parts of egg albumin and milk powder; another 15 mice served as controls. The test mice did not do well on this high protein diet; it was therefore changed to 1 part egg albumin to 2 parts milk powder. After 3 weeks on the high protein diet, 3.3 percent CaCl_2 and 2.0 percent NH_4Cl were included in the ration. Two weeks later all the surviving mice were inoculated with sarcoma 180.

There was no difference between the tumors of the treated and the control mice 3 weeks after inoculation.

ORAL ADMINISTRATION OF CALCIUM SOLUTIONS

In the following study the experimental groups received salt solutions to drink in lieu of the distilled water which the control groups received. Unless otherwise stated, these solutions were administered until the experiments were terminated.

I. CALCIUM LACTATE

Sarcoma 180 was inoculated into 20 mice. Five days after inoculation a 0.5 percent solution of calcium lactate was given to half of the mice; the concentration was gradually increased until they were getting a 5 percent solution. The other 10 mice served as controls.

When the experiment was ended, 1 month after tumor inoculation, no effect on the treated tumors was noticeable.

II. CALCIUM LACTATE + UREA

A 0.5 percent solution of calcium lactate was given to 50 mice beginning 9 days prior to inoculation with sarcoma 180. The dose was gradually increased until the groups (of 10 mice each) were receiving 1, 2, 3, 4, and 5 percent solutions of calcium lactate, respectively.

In some other experiments on proteins and cellular permeability, attention was given to urea because of its solvent action on proteins. On the chance that urea might increase the amount of calcium entering the tumor cells, urea was added to the beverages of 2 groups of the

mice 1 week after tumor inoculation. These groups received 1 percent calcium lactate plus 4 percent urea, and 2 percent calcium lactate plus 3 percent urea, respectively.

Some of the mice developed diarrhea, but most of them tolerated the solutions and survived as long as the 20 control mice. No effect on tumor growth was noted in any of the 5 groups.

III. Ca LACTATE + UREA OR CaCl_2 + UREA

A. A 1 percent solution of urea was given to 35 mice 3 weeks prior to inoculation with sarcoma 180. The concentration of urea was gradually increased to 5 percent.

On the day of inoculation, 1 percent calcium lactate was dissolved, in addition to the urea, in the solution that 15 mice received; the remaining 20 mice received a solution containing 0.2 percent CaCl_2 in addition to the urea. These solutions were administered until the experiment was terminated, the concentration of CaCl_2 being increased in the course of the experiment to 0.75 percent.

No effect on tumor growth was noted when compared with the 20 control mice.

B. The preceding experiment was repeated on a larger scale, using 150 mice.

One month prior to inoculation with sarcoma 180, a 1 percent solution of urea was given to 130 mice. The concentration was gradually increased until they were all receiving a 5 percent urea solution to drink. One week before inoculation the solution of 1 group was changed to include, in addition, 1 percent calcium lactate, and in the case of 4 other groups it was changed so as to include 0.2 percent CaCl_2 in addition to the urea. The concentration of the CaCl_2 was gradually increased until the various groups were getting solutions of the following composition:

Group	Calcium salt Percent	Urea Percent	Group	Calcium salt Percent	Urea Percent
A (control)	0	0	E	1.0 CaCl_2	5
B	0	5	F	1.5 CaCl_2	5
C	1 calcium lactate	5	G	2.0 CaCl_2	5
D	0.75 CaCl_2	5			

Most of the mice died within 3 weeks after inoculation with sarcoma 180 with the exception of the controls and the group that received 0.75 percent CaCl_2 plus 5 percent urea.

The tumor took successfully in all cases. In the treated mice that survived 3 weeks after tumor inoculation, the tumors were somewhat smaller than those in the control mice.

IV. UREA

A 1 percent urea solution was given to 20 mice; the concentration was gradually increased to a 7 percent solution before the mice showed serious effects. They were then given water for a few days and then a dilute urea solution, which was gradually made stronger until they were getting a 6 percent solution. It was amazing to see the avidity with which they drank these strong urea solutions; in a number of instances the mice fought for a turn at the nipple.

Sarcoma 180 was implanted into these mice 2 weeks after institution of the urea regime; 10 controls were inoculated at the same time.

No effect was noted on tumor growth.

V. $\text{CaCl}_2 + \text{GLUCOSE}$

A. In view of the reported hyperglycemia of cancer (Woodward and Fry), it was considered of interest to determine the effect of glucose administration on tumor growth.

Two weeks prior to inoculation with sarcoma 180 a 1 percent solution of glucose was given to 42 mice. When inoculated, the mice were divided into 2 groups; in one group the glucose concentration was increased to 3 percent; in the other it was increased to 2 percent, and 1 percent CaCl_2 was added as well.

The mice that received 3 percent glucose did well and the tumors were as large as in the 20 control mice. Those that received glucose and CaCl_2 did not do well; most of them died within 3 weeks after tumor inoculation.

B. Fifty mice were given a 1 percent glucose solution 3 weeks prior to inoculation with sarcoma 180. The mice were divided into a number of groups and the glucose concentration was increased to a maximum of 5 percent. On the day of inoculation, urea or CaCl_2 was added to some of the solutions. The various groups were finally receiving the following solutions:

Group	Glucose	Urea	CaCl_2	Group	Glucose	Urea	CaCl_2
	Percent	Percent	Percent		Percent	Percent	Percent
A (Control)				D	5	0	0
B	3	2	0	E	4	1	0
C	3	0	2	F	4	0	1

The mice of group C, which received 2 percent CaCl_2 in addition to glucose, died within 3 weeks of tumor inoculation; those in group B died off almost as fast. The other groups did about as well as the controls. It was of interest to note that the mice which received glucose were in excellent condition; their coats were noticeably fine.

No effect on tumor growth was observed.

VI. CALCIUM CITRATE + CALCIUM LACTATE

A 1 percent salt solution consisting of equal parts of calcium citrate and calcium lactate was given to 25 mice, beginning with the day of inoculation with sarcoma 180. One week later the concentration was increased to 2 percent; administration was continued until the experiment was terminated.

No effect on the tumors was noted when comparison was made with an equal number of controls.

DISCUSSION

Most of the results obtained on treating tumor-bearing mice with calcium were negative. The few instances in which there was retardation of tumor growth, or recession of the tumors, may have occurred as a result of the poor condition of the mice and not because of any specific action of calcium on the tumor. When the treatment is so drastic that the mice lose weight and vigor, caution must be exercised in assigning the cause of the mildly inhibiting effects that were sometimes noted.

The slight retardation of tumor growth which was occasionally noted in the treated mice was not regularly reproducible. If calcium does have a retarding effect on tumor growth, the effect is apparently only a minor one and is operative only when other factors are favorable.

This latter hypothesis was tested by administering other substances together with the calcium salt. In view of the statements made as to the value of offsetting alkalinity in cancer, NH_4Cl was given because of its acid-forming properties. Urea was given because of its solvent effect on proteins, and because it might thereby affect cellular permeability. Glucose and lactate were given on the chance that they might disturb the carbohydrate metabolism of the tumor cells and thus interfere with their proliferation. A high protein diet was given because other experiments indicated that proteins might affect fluid exchange between the malignant cells and the tissue fluids. Citrate, because of its role in the prevention of fibrin formation from fibrinogen, was given following some observations on fibrin formation made in the course of another investigation.

These substances were given alone and together with calcium. In no case was a clear-cut, regularly obtainable, inhibiting or retarding effect noted. Since promising results were not obtained with transplanted tumors, the experiments were not extended to spontaneous tumors.

This lack of pronounced effect cannot be due to failure of the calcium to penetrate into the tumor cell. Kluge has shown that when CaCl_2 or calcium gluconate is injected subcutaneously, there occurs a rapid increase in the calcium content of tumors. The calcium content

September 8, 1933

rises to a maximum in about 2 hours and then decreases almost as rapidly, reaching the original value about 4 hours later. This work shows that calcium enters and leaves the tumor with ease.

Although a considerable number of authors have asserted that calcium has a retarding effect, the individual contributions are far from convincing. A common weakness is the employment of an insufficient number of experimental animals. Another weakness is the utilization of single experiments as the basis for conclusions regarding the positive value of substances used therapeutically. Unfortunately, repetition of experiments in an apparently identical fashion does not always give the same results in the case of transplanted tumors. A given strain of tumor may vary in its characteristics, growing well at times and poorly at others. Not infrequently a portion of the tumor may be infected; if it so happens that the test mice are inoculated with pieces of infected tumor whereas the control mice receive uninfected pieces, the poor growth of the tumors in the test group may be unjustifiably ascribed to the therapeutic treatment. It is of importance, therefore, not only to use a sufficiently large number of test animals and control animals, but also to repeat the experiments which give positive results. Only when the positive results are obtainable with regularity is it permissible to ascribe the beneficial results to the treatment.

In this investigation no untoward results were noted following the use of moderate amounts of calcium. Calcium salts may, in fact, be found to have a use in the treatment of cancer patients (Behan), since it appears that calcium is capable of alleviating pain in a number of clinical conditions. No contra-indication to the use of calcium was noted in this study.

SUMMARY

1. The effect of treatment with calcium salts on mouse sarcoma 180 and mouse carcinoma 63 was studied using more than 1,200 tumor-bearing mice.
2. Calcium chloride, calcium lactate, calcium citrate, and calcium gluconate were employed. The salts were administered either in the drinking water or mixed with the food, or were injected parenterally.
3. A definite, regular, retarding effect on tumor growth was not obtained.

BIBLIOGRAPHY

- Barelli, L.: Zeit. Krebs., **29**, 376-88 (1929).
- Beebe, S. P.: Amer. J. Physiol., **12**, 167-72 (1904-5).
- Behan, R. J.: Amer. J. Surgery, **17**, 242-6 (1932).
- Beregoff, P.: J. Cancer Res., **14**, 559-67 (1930).
- Cramer, W.: Biochem. J., **12**, 210-20 (1918).
- De Fermo, C.: Minerva Med., **1**, 864-7 (1930).
- Goldfeder, A.: Zeit. Krebs., **27**, 503-36 (1928).
- Goldzieher: Verhandl. deut. path. Gesell., **15**, 283-8 (1912).
- Goldzieher, M., and Rosenthal, E.: Zeit. Krebs., **13**, 320-31 (1913).
- Händel, M.: Zeit. Krebs., **21**, 281-7 (1924).
- Harde, E.: Compt. Rend. Soc. Biol., **109**, 435-7 (1929).
- Harnes, A. R.: J. Exp. Med., **50**, 109-20 (1929).
- Hoshino, T.: J. Osaka Med. Soc., **21**, No. 11 (1922). Abstract in Japan Med. World, **3**, 51 (1923).
- Jinguu: Trans. Japan. Path. Soc., **21**, 743-7 (1931).
- Katase, Kawamura, and Mizutani: Verhandl. japan. path. Gesell., Tokio, X Tagung, p. 107 (1920). [Cited by Händel and by Goldfeder].
- Kimura, T., and Wada, Y.: Gann (Jap. J. Cancer Res.) **17**, 59-61 (1923).
- Koerbler, G.: Compt. Rend. Soc. Biol., **92**, 628 (1925).
- Leicher, H.: Münch. med. Woch., **72**, 762 (1925).
- McDonald, E.: Science, **69**, 175-7 (1929). Ibid., **74**, 55-60 (1931).
- Paik, T. S.: Trans. Japan. Path. Soc., **20**, 653-4 (1930), and Amer. J. Cancer, **15**, 2756-64 (1931).
- Reding, R.: Arch. Internat. Méd. Expér., **3**, 712-80 (1927) and Le Cancer (Bruxelles), **5**, 97-132 (1928).
- Reding, R., and Slosse, A.: Bull. Assoc. franc. Étude Cancer, **18**, 122-51 (1929).
- Rémond, A., Sendrail, M., and Lassalle: Compt. Rend. Soc. Biol., **93**, 1061-3 (1925).
- Renaud, A.: Bull. Assoc. franc. Étude Cancer, **13**, 288-97 (1924).
- Roffo, A. H.: Bol. Inst. Med. Exp., **1**, 307-23, 537-45 (1924-5), and Néoplasmes, **4**, 148-56 (1925).
- Roffo, A. H. and Encina, A.: Bol. Inst. Med. Exp., **1**, 633-43 (1924-5).
- Rohdenburg, G. L., and Krehbiel, O. F.: J. Cancer Res., **7**, 417-37 (1922).
- Roussy, G., and Wolf, M.: Arch. Néerl. Physiol., **7**, 562-70 (1922).
- Shear, M. J.: Amer. J. Cancer (in press).
- Slosse and Reding: Bull. Acad. Roy. Med. Belg., [5] **4**, 268-90 (1924).
- Steenbock, H., and Black, A.: J. Biol. Chem., **64**, 263-298 (1925).
- Sugiura, K., and Benedict, S. R.: J. Cancer Res., **7**, 329-69 (1922).
- Sugiura, K., Noyes, H. M., and Falk, K. G.: J. Cancer Res., **6**, 285-303 (1921).
- Svehla, K.: Compt. Rend. Soc. Biol., **94**, 980-1 (1926).
- Theis, R. C., and Benedict, S. R.: J. Cancer Res., **8**, 499-503 (1924).
- Troisier, J., and Wolf, M.: Compt. Rend. Soc. Biol., **86**, 651-2 (1922).
- Waterman, N.: Biochem. Zeit., **133**, 535-97 (1922).
- Wolf, M.: Compt. Rend. Acad. d. sc., **176**, 1932-4 (1923).
- Woodward, G. E., and Fry, E. G.: Biochem. J., **26**, 889-97 (1932).

THE INTELLIGENCE OF THE PROSPECTIVE IMMIGRANT

The Public Health Service has recently published a report¹ on a study of the intelligence of about 500 applicants for American visas in Warsaw, Poland, as measured by their ability to do language and nonlanguage tests. In giving the tests, trained interpreters were used and the methods were standardized throughout. The group studied was a fair sample of applicants for visas but not of the general population of Poland. The persons studied were between 15 and 45 years of age, of both sexes, and selected from both Slavish and Jewish applicants for visas.

The most valuable of the language and nonlanguage tests have been grouped into scales with appropriate percentile tables for the quantitative interpretation of the results.

A method for setting up a standard of literacy is suggested.

Analysis of the data indicates that—

1. On performance tests the results obtained compare fairly well with those published for American school children over 10 years of age.
2. On language tests the results fall definitely, and for certain tests, strikingly, below those for American school children over age 10.
3. Differences in ability on both language and nonlanguage tests are found to be associated with sex, schooling, and age. Differences associated with race are slight. On nonlanguage tests, the greatest differences are associated with sex; on language tests, with schooling. The most consistent variation is that associated with age, the older groupings tending very uniformly to give poorer results on both types of tests.
4. Differences associated with sex are more marked than those found among American school children and are more marked on nonlanguage than on language tests.
5. Weighting of "raw" scores apparently adds little to the discriminative value of a given test.
6. When an opportunity is given to learn by experience, apparent differences in ability between groups tend to decrease.

The standards will be of assistance in the determination of mental ability in persons from Eastern Europe without much education. In addition to their value in immigration work, they should be useful in institutions dealing with foreign-born persons suspected of being mentally defective.

COURT DECISION RELATING TO PUBLIC HEALTH

Provision of city ordinance regarding use of marked bottles or other containers for milk held invalid.—(Florida Supreme Court, Div. B; *Logan, Chief of Police, v. Alfieri*, 148 So. 872; decided June 9, 1933.) An ordinance relating to milk contained the following.

¹ Public Health Bulletin No. 206

(c) Milk, cream, or buttermilk may be delivered, distributed, sold, offered for sale, or held for sale in either plain or marked bottles, carton[s], or other containers. When marked bottles, cartons, or other containers are used, it shall be unlawful for said bottle, carton, or other container to bear any name, trade name, or trade mark other than that of the producer or distributor whose name appears upon the cap, seal, or cover of said bottle, carton, or container.

The defendant in error sued out a writ of habeas corpus alleging that he was unlawfully restrained of his liberty upon a charge of violating the above-quoted paragraph. It was contended in the lower court that the said paragraph was unconstitutional and void because in conflict with section 1 of the declaration of rights of the State constitution. The court held the paragraph in question to be unconstitutional and invalid, and the case was taken to the supreme court.

The latter court said that the provision of the ordinance under consideration, in effect, required that the name of the producer or distributor should appear upon the cap, seal, or cover of the bottle, carton, or container, and that in that provision the ordinance must certainly be held to be within the police power. But it was pointed out that the provision went further, the court saying that "The trade name of the manufacturer of the milk bottle blown into the side or bottom of the bottle cannot, by any reasonable conclusion, mislead the consumer as to the contents of the bottle nor as to the identity of the producer or distributor of the milk." The view was taken that the provision in question was invalid, the supreme court concluding its opinion with the following:

If the language used in the ordinance could be construed to mean only that the use, by one producer or distributor, of bottles bearing the name or trade-mark of another producer or distributor is prohibited, it could be held valid, but, if construed otherwise, it would effect an unwarranted interference with property rights.

There is nothing before us to show in what manner the ordinance was alleged to have been violated. The ordinance, on its face and according to its plain language, is unreasonable and arbitrary and easily lends itself to unlawful interference with individual rights and to the oppression of the weak.

The judgment of the court below was affirmed.

DEATHS DURING WEEK ENDED AUGUST 19, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Aug. 19, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths.....	6,454	6,544
Deaths per 1,000 population, annual basis.....	9.0	9.3
Deaths under 1 year of age.....	442	606
Deaths under 1 year of age per 1,000 estimated live births (85 cities).....	37	50
Deaths per 1,000 population, annual basis, first 33 weeks of year.....	11.1	11.5
Data from industrial insurance companies:		
Policies in force.....	67,700,560	71,207,172
Number of death claims.....	11,220	11,355
Death claims per 1,000 policies in force, annual rate.....	8.6	8.3
Death claims per 1,000 policies, first 33 weeks of year, annual rate.....	10.1	9.9

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended August 26, 1933, and August 27, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended August 26, 1933, and August 27, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932
New England States:								
Maine	1	1					0	0
New Hampshire							0	0
Vermont					4	2	0	0
Massachusetts	15	14		1	28	27	1	2
Rhode Island	2				5	1	0	0
Connecticut	4	5		1	1	14	0	0
Middle Atlantic States:								
New York	23	42	13	13	45	106	10	5
New Jersey	10	11	1	1	15	59	0	0
Pennsylvania	27	30			57	40	3	7
East North Central States:								
Ohio	10	24		1	10	8	0	1
Indiana	13	35	55	17	5	5	0	4
Illinois	19	37	20	2	8	33	3	0
Michigan	24	3			8	29	0	2
Wisconsin	5	7	19	20	12	27	0	3
West North Central States:								
Minnesota	6	4		1	11	5	1	0
Iowa	4	4				1	0	0
Missouri	9	9	7	2	1	5	1	1
North Dakota	5	2			11	7	1	1
South Dakota					1		0	1
Nebraska	3	8			3	3	1	0
Kansas	6	9		3	10	89	0	0
South Atlantic States:								
Delaware							0	0
Maryland	7	16	5	13	2	8	0	0
District of Columbia	8	5	1		3	2	0	0
Virginia	27	19			15	25	1	0
West Virginia	26	15	25	11	15	23	1	0
North Carolina	41	35	4	2	13	23	1	1
South Carolina	25	10	83	99	34	22	0	0
Georgia	49	15		18	32	7	0	1
Florida	11	14	2	1	32	2	0	0

See footnotes at end of table.

*Cases of certain communicable diseases reported by telegraph by State health officers
for weeks ended August 26, 1933, and August 27, 1932—Continued*

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Aug. 26, 1933	Week ended Aug. 27, 1933	Week ended Aug. 26, 1933	Week ended Aug. 27, 1933	Week ended Aug. 26, 1933	Week ended Aug. 27, 1933	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932
East South Central States:								
Kentucky	30	43	15				0	2
Tennessee	14	38	19	8	20	2	1	1
Alabama ¹	47	39	11	7	11	1	0	1
Mississippi ¹	26	27					0	0
West South Central States:								
Arkansas	12	10	4	7	5		0	0
Louisiana	20	17	5	6	6	2	2	1
Oklahoma ¹	26	26	9	13	11		0	0
Texas ¹	57	43	52	5	28	8	1	0
Mountain States:								
Montana			2		1	106	0	1
Idaho					1		0	0
Wyoming					1		0	0
Colorado	4	8				4	0	0
New Mexico	2	6			2		0	0
Arizona	2	2			11	1	0	0
Utah ¹	1				9	1	0	1
Pacific States:								
Washington	1	2			8	4	4	0
Oregon	2	6	5	7	11	15	0	0
California	23	38	17	160	70	28	3	2
Total:	643	684	366	419	575	750	35	38

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 26, 1933	Week ended Aug. 27, 1933	Week ended Aug. 26, 1932	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932
New England States:								
Maine	2	0	6	8	0	0	3	4
New Hampshire	1	0	1	1	0	0	0	0
Vermont	0	0	4	8	0	0	1	0
Massachusetts	35	1	70	78	0	0	7	8
Rhode Island	2	2	8	9	0	0	1	1
Connecticut	0	1	14	7	0	0	3	0
Middle Atlantic States:								
New York	133	22	73	109	0	8	40	54
New Jersey	17	33	19	38	0	0	5	12
Pennsylvania	29	136	108	77	0	0	41	68
East North Central States:								
Ohio	20	0	85	62	0	1	48	70
Indiana	2	0	31	33	0	1	23	29
Illinois	17	6	103	60	0	0	32	42
Michigan	8	5	62	51	0	0	40	14
Wisconsin	2	1	11	12	4	0	3	0
West North Central States:								
Minnesota	18	7	19	14	1	0	0	6
Iowa ¹	0	1	13	8	0	4	2	7
Missouri	2	0	8	10	0	0	20	48
North Dakota	5	4	7	9	0	0	6	2
South Dakota	0	2	2	1	0	0	2	5
Nebraska	2	1	16	12	0	1	0	7
Kansas	2	2	35	17	0	0	8	15
South Atlantic States:								
Delaware	8	0	8	4	0	0	7	3
Maryland ¹	0	2	14	23	0	0	13	31
District of Columbia	0	1	4	6	0	0	3	2
Virginia	0	2	30	32	0	0	26	47
West Virginia	5	4	24	14	0	0	48	73
North Carolina ¹	1	1	37	32	0	0	24	22
South Carolina ¹	1	4	3	6	1	0	32	36
Georgia ¹	0	0	15	19	0	0	40	64
Florida ¹	0	0	2	2	0	0	4	4

See footnotes at end of table.

September 8, 1933

*Cases of certain communicable diseases reported by telegraph by State health officers
for weeks ended August 26, 1933, and August 27, 1932—Continued.*

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Aug. 26, 1933	Week ended Aug. 27, 1933	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932	Week ended Aug. 26, 1933	Week ended Aug. 27, 1932
East South Central States:								
Kentucky	0	0	39	33	0	0	100	98
Tennessee	6	3	65	18	0	1	67	94
Alabama	0	1	24	28	0	0	25	43
Mississippi	0	1	5	7	0	4	9	26
West South Central States:								
Arkansas	0	1	4	8	0	1	28	20
Louisiana	2	1	12	6	0	0	26	36
Oklahoma	4	0	5	12	0	1	46	55
Texas	1	0	31	16	2	3	54	33
Mountain States:								
Montana	1	0	0	4	1	2	3	7
Idaho	0	0	4	1	0	0	0	7
Wyoming	0	0	2	4	0	8	0	0
Colorado	0	1	3	11	0	0	7	9
New Mexico	0	0	1	6	0	0	3	2
Arizona	0	1	4	0	0	0	2	6
Utah	1	0	2	0	0	0	1	1
Pacific States:								
Washington	2	2	14	8	0	5	4	7
Oregon	0	2	4	7	2	1	6	4
California	3	2	48	34	5	4	9	11
	332	253	1,099	965	16	45	868	1,133

¹ New York City only.² Week ended earlier than Saturday.³ Rocky Mountain spotted fever, week ended Aug. 26, 1933, 3 cases as follows: Maryland 2 and North Carolina 1.⁴ Typhus fever, week ended Aug. 26, 1933, 61 cases as follows: North Carolina, 1; South Carolina, 1; Georgia, 18; Florida, 5; Alabama, 28; Texas, 8.⁵ Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Menin- gococ- cus- menin- gitis	Diph- theria	Influ- enza	Mala- ria	Men- ties	Pel- lagra	Pollo- mye- litis	Scarlet fever	Small- pox	Ty- phoid fever
<i>June 1933</i>										
Hawaii Territory		16	5					0	2	0
<i>July 1933</i>										
Alabama	4	46	22	335	116	96	1	50	0	157
Delaware	1	5			19		2	6	0	9
Georgia	1	52	63	337	158	49	0	20	5	190
Idaho	4	1	11		8		1	10	8	12
Louisiana	2	32	29	193	50	56	3	23	0	121
North Carolina	5	58	4		399	137	1	104	0	171
Oklahoma	2	45	41	174	85	19	0	26	6	170
Oregon	5	45	3	161			1	58	29	23
Puerto Rico	34	93	2,823	121			0		0	28
South Carolina	146	376	1,120	330	372		0	10	2	204
Washington	1	5	20		163		2	40	20	17
Wisconsin	3	16	47		229		0	104	28	16

	June 1933	July 1933—Continued	July 1933—Continued
Hawaii Territory:	Cases	Impetigo contagiosa:	Cases
Chicken pox	61	Oregon	12
Conjunctivitis, follicular	29	Washington	1
Hookworm disease	38	Leprosy:	
Impetigo contagiosa	2	Louisiana	1
Leprosy	4	Puerto Rico	3
Mumps	51	Lethargic encephalitis:	
Tetanus	3	Alabama	3
Whooping cough	280	South Carolina	1
		Washington	4
<i>July 1933</i>			
Anthrax:		Mumps:	
Delaware	1	Alabama	20
Louisiana	1	Georgia	27
Botulism:		Louisiana	18
Washington	1	Oklahoma	8
Chicken pox:		Oregon	11
Alabama	19	Puerto Rico	21
Delaware	7	South Carolina	40
Georgia	16	Washington	57
Idaho	9	Wisconsin	74
Louisiana	2	Ophthalmia neonatorum:	
North Carolina	33	Alabama	1
Oklahoma	11	North Carolina	1
Oregon	40	Puerto Rico	4
Puerto Rico	17	South Carolina	9
South Carolina	31	Wisconsin	1
Washington	277	Paratyphoid fever:	
Wisconsin	440	Georgia	1
Dengue:		Louisiana	2
Alabama	2	North Carolina	2
Georgia	1	Oregon	7
South Carolina	5	South Carolina	7
Diarrhea:		Puerperal septicemia:	
South Carolina	1,130	Puerto Rico	10
Dysentery:		Rabies in animals:	
Georgia (amebic)	8	Louisiana	5
Georgia (bacillary)	34	Washington	9
Louisiana	2	Rabies in man:	
Oklahoma	60	Alabama	1
Oregon	2	Rocky Mountain spotted	
Puerto Rico	264	fever:	
Washington	1	Idaho	4
Filariasis:		North Carolina	9
Puerto Rico	3	Oregon	4
German measles:		Scabies:	
North Carolina	7	Oklahoma	2
Washington	5	Oregon	7
Wisconsin	9	Septic sore throat:	
Hookworm disease:		Georgia	31
Georgia	80	Louisiana	1
Louisiana	28	North Carolina	3
South Carolina	97	Oklahoma	24
		Oregon	2

¹ Exclusive of Oklahoma City and Tulsa.

LETHARGIC ENCEPHALITIS IN THE UNITED STATES

Reports of cases of lethargic encephalitis are not received by telegraph, and current reports are incomplete. For the week ended August 26, 1933, the following reports were received before this issue of the PUBLIC HEALTH REPORTS went to press:

State	Cases
Illinois	8
Indiana	1
Kansas	6
Oklahoma	5
West Virginia	2

The city of St. Louis reported 75 cases and 11 deaths for the week.

Reports from other localities were scattering and did not show epidemic prevalence anywhere except in St. Louis, city and county, Missouri.

September 8, 1933

WEEKLY REPORTS FROM CITIES

City reports for week ended August 19, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0		0	0	2	0	0	0	3	8	33
New Hampshire:											
Concord	0		0	0	1	0	0	0	0	0	7
Nashua	0		0	0	0	0	0	0	0	0	0
Vermont:											
Barre	0		0	0	0	0	0	0	0	1	4
Burlington	0		0	0	0	0	0	0	0	0	1
Massachusetts:											
Boston	4	1	0	6	10	20	0	11	0	53	196
Fall River	3	0	0	0	0	3	0	3	0	5	22
Springfield	0		0	0	1	2	0	0	0	4	24
Worcester	1		0	12	0	3	0	2	0	5	46
Rhode Island:											
Pawtucket	0		0	0	0	0	0	0	0	0	10
Providence	0		0	0	0	3	0	4	0	35	49
Connecticut:											
Bridgeport	0		0	3	1	2	0	2	0	2	18
Hartford	0		0	0	0	1	0	0	0	0	26
New Haven	0		0	0	1	0	0	1	0	7	29
New York:											
Buffalo	0		1	9	14	9	0	7	0	51	131
New York	16	1	5	16	82	9	0	78	20	140	1,051
Rochester	0		0	1	1	3	0	0	0	5	40
Syracuse	0		0	0	1	3	0	1	0	7	29
New Jersey:											
Camden	0		0	1	0	1	0	0	1	0	20
Newark	0		0	2	3	1	0	0	2	28	59
Trenton	0		0	0	2	0	0	0	0	3	21
Pennsylvania:											
Philadelphia	1	2	2	18	9	16	0	25	5	13	340
Pittsburgh	1	2	1	1	8	6	0	4	8	35	120
Reading	0		0	0	1	1	0	0	0	0	20
Ohio:											
Cincinnati	0		0	4	1	8	0	0	2	42	101
Cleveland	3	4	0	1	6	7	0	0	2	57	124
Columbus	2	1	1	1	0	11	0	0	0	4	67
Toledo	0		0	1	3	11	0	0	1	12	56
Indiana:											
Fort Wayne	1		0	0	0	0	0	0	0	1	18
Indianapolis	1		0	0	3	5	0	4	2	2	17
South Bend	0		0	0	1	1	0	0	0	1	16
Terre Haute	0		0	0	0	0	0	2	0	0	1
Illinois:											
Chicago	1	2	0	6	23	49	0	46	4	75	505
Michigan:											
Detroit	4		0	3	6	11	0	12	1	88	179
Flint	1		0	0	1	0	0	2	0	2	19
Grand Rapids	0		0	0	1	3	0	0	1	10	25
Wisconsin:											
Kenosha	0		0	0	0	0	0	0	0	9	8
Milwaukee	0		0	1	1	4	0	6	0	123	74
Racine	0		0	1	0	0	0	1	0	36	11
Superior	0		0	0	0	0	0	0	0	0	11
Minnesota:											
Duluth	0		0	1	1	1	0	3	0	11	23
Minneapolis	4		0	0	0	0	0	1	0	7	74
St. Paul	0		0	1	1	2	0	2	1	19	39
Iowa:											
Des Moines	4		0	0	0	4	0	0	0	0	19
Sioux City	1		0	0	0	1	0	0	0	4	-----
Waterloo	2		0	0	0	0	0	0	0	4	-----
Missouri:											
Kansas City	3		0	3	3	2	0	5	0	12	77
St. Joseph	0		0	1	0	1	0	0	0	1	21
St. Louis	8		0	6	5	3	0	5	1	10	173
North Dakota:											
Fargo	0		0	2	0	0	0	0	1	0	8
Grand Forks	0		0	0	0	0	0	0	0	0	0
South Dakota:											
Aberdeen	0		0	0	0	1	0	0	0	2	0
Nebraska:											
Omaha	1		0	2	9	3	0	1	0	4	47

City reports for week ended August 19, 1933—Continued

September 8, 1933

City reports for week ended August 19, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Washington:											
Seattle	0			1	2	3	0	4	1	15	83
Spokane	0			9	1	0	0	0	0	1	32
Tacoma											
Oregon:											
Portland	0		0	1	1	5	0	3	1	1	51
Salem	0		0	0	0	0	0	0	1	0	
California:											
Los Angeles	11	5	0	9	11	13	0	9	4	75	280
Sacramento				0	0	1	1	2	0	0	24
San Francisco	0		0	0	4	6	0	8	0	5	149

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:							
Boston			28	St. Louis	0	0	2
Worcester			3	North Dakota:	0	0	1
New York:				Fargo	0	0	
New York	1	0	102	Delaware:	0	0	
Syracuse	0	0	1	Wilmington	0	0	1
New Jersey:				Maryland:	1	0	0
Newark	0	0	3	Baltimore	0	0	1
Trenton	0	0	1	Cumberland	0	0	
Pennsylvania:				West Virginia:	0	0	
Pittsburgh	1	0	7	Wheeling	0	0	1
Ohio:				Georgia:	0	0	
Cleveland	1	0	3	Atlanta	0	0	1
Indiana:				Tennessee:	0	0	
Indianapolis	4	2	0	Memphis	0	0	1
Illinois:				Montana:	0	0	
Chicago	5	1	12	Missoula	0	0	1
Michigan:				Washington:	0	0	
Detroit	0	0	4	Seattle	0	0	3
Grand Rapids	1	0	0	Oregon:	0	0	
Minnesota:				Portland	0	0	2
Minneapolis	0	0	3				
St. Paul	0	0	1				

Typhus fever.—Cases: Charleston, S.C., 1; Atlanta, Ga., 3; Savannah, Ga., 2; Tampa, Fla., 2; and Birmingham, Ala., 1. Deaths: Savannah, Ga., 1.

Pellagra.—Cases: Bridgeport, Conn., 1; Washington, D.C., 1; Charleston, S.C., 3; Atlanta, Ga., 1; Savannah, Ga., 3; and Memphis, Tenn., 1.

Lethargic encephalitis.—Cases: New York, N.Y., 1; Detroit, Mich., 1; Kansas City, Mo., 1; St. Louis, Mo., 44.

Rabies in man.—Deaths: Wilmington, N.C., 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Two weeks ended August 12, 1933.—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the 2 weeks ended August 12, 1933, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chicken pox		2		27	80	5	41		36	191
Diphtheria		6	7	19	13	7	1			53
Dysentery									1	1
Erysipelas				7	2	1	1		2	13
Influenza		15		1	1				11	28
Lethargic encephalitis				1						1
Measles				60	17	2	4		1	84
Mumps					41	7	7		7	62
Paratyphoid fever					9					9
Pneumonia		2			4		5		2	13
Poliomyelitis				6	6				2	14
Scarlet fever		7	5	36	33	13	2		10	106
Trachoma									4	4
Tuberculosis	3		32	107	63	17	7		42	271
Typhoid fever		2	5	60	27	1	3		1	99
Undulant fever					9					9
Whooping cough				7	153	281	90	24		570

Vital statistics—Year 1932.—The following table shows the number of births, deaths, and marriages reported in Canada during 1932, together with the deaths reported from certain causes. The figures are provisional.

Population (estimated)	10,463,000
Number of births	235,143
Birth rate per 1,000 population	22.4
Number of stillbirths	7,254
Infant mortality per 1,000 live births	73.2
Number of deaths	104,190
Death rate per 1,000 population	9.9
Number of marriages	62,514
Number of deaths from—	
Bronchitis	432
Cancer and other malignant tumors	10,014
Diabetes mellitus	1,342
Diarrhea and enteritis	3,734
Diphtheria	308
Erysipelas	228
Heart disease	15,320

Number of deaths from—Continued	
Influenza	4,220
Measles	328
Meningitis	378
Nephritis	5,631
Pneumonia	7,024
Poliomyelitis and polioencephalitis	163
Puerperal causes	1,180
Scarlet fever	196
Smallpox	17
Suicides	1,021
Tuberculosis, respiratory	5,836
Tuberculosis, other forms	1,267
Typhoid fever	336
Venereal diseases	542
Whooping cough	540

CUBA

Habana—Communicable diseases—4 weeks ended August 12, 1933.—During the 4 weeks ended August 12, 1933, certain communicable diseases were reported in Habana, Cuba, as follows:

September 8, 1933

Disease	Cases	Deaths
Diphtheria	10	3
Malaria	20	2
Tuberculosis	19	5
Typhoid fever	10	8

GREAT BRITAIN

Scotland—Vital statistics—Quarter ended June 30, 1933.—The Registrar General of Scotland has published the following statistics for the second quarter of the year 1933:

Population (estimated)	4,916,000	Deaths from—Continued	
Births	23,212	Influenza	135
Birth rate per 1,000 population	18.9	Lethargic encephalitis	21
Deaths	15,121	Measles	13
Death rate per 1,000 population	12.3	Nephritis, acute	69
Marriages	8,176	Nephritis, chronic	266
Deaths under 1 year	1,704	Nephritis, unspecified	89
Deaths under 1 year per 1,000 births	73	Pneumonia, lobar	319
Deaths from—		Pneumonia, undefined	176
Bronchitis	579	Pollomyelitis	6
Broncho-pneumonia	470	Puerperal sepsis	43
Cancer	1,862	Scarlet fever	52
Cerebrospinal fever	56	Syphilis	24
Diabetes	154	Tetanus	3
Diphtheria	76	Tuberculosis	1,043
Dysentery	3	Typhoid fever	5
Erysipelas	48	Whooping cough	251
Heart disease			
	2,494		

JAMAICA

Communicable diseases—Four weeks ended June 17, 1933.—During the 4 weeks ended June 17, 1933, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island of Jamaica, outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox		19	Leprosy	1	3
Diphtheria	1	1	Puerperal fever		5
Dysentery	7	20	Tuberculosis	34	78
Erysipelas		1	Typhoid fever	17	59

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Aug. 25, 1933, pp. 1056-1068. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Sept. 29, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

India—Chittagong.—During the week ended August 19, 1933, 1 case of cholera with 1 death was reported in Chittagong, India.

Philippine Islands.—During the week ended August 26, 1933, cholera was reported in the Philippine Islands as follows: Province of Cebu, Santa Fe, 2 cases; Province of Samar, Calbayog, 5 cases, 4 deaths; Santa Margarita, 10 cases, 5 deaths.

Plague

Egypt—Qena Province.—During the week ended August 19, 1933, 1 case of plague with 1 death was reported in Qena Province, Egypt.

Typhus Fever

Irish Free State—Lismore.—During the week ended August 12, 1933, 1 case of typhus fever was reported in Lismore, Waterford County, Irish Free State.

X